

Vishnu Kadiyala

Ph.D. Candidate, Computer Science
University of Oklahoma

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Research Focus

Multi-Agent Reinforcement Learning under Partial Observability; Implicit Coordination via Learned Belief Representations; Decentralized Policies without Explicit Communication; Learning Dynamics and Stability in Cooperative MARL Systems; Autonomous Driving and Multi-Agent Decision Making.

Education

University of Oklahoma , Norman, OK Ph.D. in Computer Science	Expected May 2027
University of Oklahoma , Norman, OK M.S. in Electrical and Computer Engineering	May 2022
KLE Technological University , India B.E. in Electronics and Communication Engineering	May 2019

Technical Expertise

Programming: Python, MATLAB

Machine Learning: Deep Learning, Transformers, CNNs, Diffusion Models, Multi-Agent Reinforcement Learning

Frameworks: TensorFlow, Keras

Data & Systems: Pandas, Xarray, NetCDF, High-Performance Computing, SLURM

Tools: GitHub, Linux

Research Experience

NSF AI2ES — Graduate Researcher

Jan 2024 – May 2025

- Designed a Transformer-based architecture for learning latent representations from irregular observations, contributing to broader research on belief modeling and decision-making under partial observability.
- Achieved a $13\times$ improvement over the classical Marshall–Palmer physics-based rainfall model using a parameter-efficient ($\sim 2.5\text{M}$) neural architecture.
- Developed a vision-based atmospheric visibility estimation system using outdoor camera imagery, enabling statewide inference beyond sparsely deployed ASOS stations.
- Demonstrated cost-effective expansion of environmental monitoring networks through data-driven sensor fusion.

NASA GeoCARB — Graduate Researcher

Jan 2021 – May 2023

- Developed a U-Net-based deep learning model achieving 95% accuracy for methane hotspot and leak detection from satellite observations.
- Identified persistent high-emission methane sources exceeding EPA estimates via geospatial inference.
- Proposed a real-time anomaly detection framework for emerging methane sources using satellite time-series data.
- Improved anomaly detection accuracy from 80% (FCN baseline) to 90.2% using diffusion-based generative models.

Document Understanding with Deep Learning

Aug 2021 – May 2022

- Designed neural architectures for table and plot localization in documents, achieving 99% detection accuracy.
- Constructed high-quality annotated datasets and automated LaTeX document generation pipelines using PyLaTeX.
- *Master's Thesis: Localization of Tables and Plots in Documents Using Deep Neural Networks.*

Publications

Peer-Reviewed Conference Papers

- M. X. Sasser, M. Wilson Reyes, **V. P. Kadiyala**, A. Kurbanovas, K. J. Sulia, et al.
Estimating Statewide Atmospheric Visibility From Camera Images.
Proceedings of the 105th Annual American Meteorological Society (AMS) Meeting, 2025.
- E. Spicer, S. Crowell, F. Xu, **V. P. Kadiyala**, P. M. Klein, et al.
Exploring the Influence of Local Urban and Industrial Carbon-Based Pollutant Sources on Total Column Concentration Enhancements in Houston, Texas during TRACER.
Proceedings of the 104th AMS Annual Meeting, 2024.

Conference Abstracts

- E. Spicer, S. Crowell, F. Xu, N. Krishnakutty, **V. P. Kadiyala**, et al.
Urban and Industrial Carbon-Based Pollutant Monitoring Using EM27/SUNs in Houston, Texas During the Summer 2022 GeoCarb-TRACER Campaign.
American Meteorological Society Meeting Abstracts, 2023.

Theses

- **V. P. Kadiyala.**
Localization of Tables and Plots in Documents Using Deep Neural Networks.
Master's Thesis, University of Oklahoma, 2022.

Early Conference Publications

- C. H. Vishnu Kadiyala, V. Hulyalkar.
Wireless Video Transmission over 2.4 GHz Frequency.
International Conference on New Trends in Engineering & Technology, 2018.

- **R. B. S. , Vishnu Priyatamkumar Kadiyala**
Design and Implementation of Plant Growth Monitoring System Using Infrared Radiation.
 International Conference on Electrical, Electronics & Communication, 2018.

Preprints & Working Papers

- **V. P. Kadiyala.** Implicit Coordination via Attention-Based Latent Belief Updates in Decentralized Partially Observable Multi-Agent Systems. *In preparation for ICML submission.*

Industry & Engineering Experience

Formula Student India & Formula Student Lincoln

Jun 2017 – May 2021

- Designed and implemented vehicle data acquisition systems using Raspberry Pi and Python.
- Led the electrical subsystem for suspension travel sensing and engine diagnostics.
- Improved vehicle thermal performance through data-driven radiator repositioning.

Test Automation Intern — Robert Bosch Engineering & Business Solutions Jan 2019 – May 2019

- Developed hardware-in-the-loop (HIL) test automation pipelines for Engine Control Units (ECUs).
- Automated ECU software validation using ETAS LABCAR across hardware and digital fault layers.